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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/826,787	04/16/2004	Scott A. McHugo	10030222-4	1281
57299	7590	09/12/2007		
Kathy Manke Avago Technologies Limited 4380 Ziegler Road Fort Collins, CO 80525			EXAMINER PERKINS, PAMELA E	
			ART UNIT 2822	PAPER NUMBER
			NOTIFICATION DATE 09/12/2007	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/826,787

Applicant(s)

MCHUGO ET AL.

Examiner

Pamela E. Perkins

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 June 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14, 16 and 17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 14, 16 and 17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

This office action is in response to the filing of the request for reconsideration on 21 June 2007. Claims 14, 16 and 17 are pending; claims 1-13 and 15 have been previously cancelled.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Feng et al. (6,727,530) in view of *Applicant's admitted prior art*.

Feng et al. disclose a heterojunction bipolar transistor where a collector (203-g) is atop a sub-collector (203-e), a base (203-h) atop the collector (203-h); a base contact (213) atop the base (203-h); an emitter (E; 203-k) atop the base (203-h); an emitter cap (203-l) atop the emitter (E; 203-k), the emitter cap (203-l) comprising a second sidewall with a second reentry feature consisting entirely of a second undercut profile, and an emitter metal (211) atop the emitter cap (203-l). Feng et al. further disclose the collector (203-g) comprising a third sidewall reentry feature consisting entirely of a third undercut profile (Fig. 1 & 2; col. 4, lines 30-56; col. 6, lines.20-43). Feng et al. do not disclose the emitter comprising a first sidewall with a first reentry feature consisting entirely of a first undercut profile.

Applicant's admitted prior art discloses a heterojunction bipolar transistor where a base (14) is atop a collector (12); a base contact (24) atop the base (14); an emitter (16) atop the base (14), the emitter (16) comprising first sidewall with a first reentry feature consisting entirely of a first undercut profile; an emitter cap (218I) atop the emitter (16), and an emitter metal (22) atop the emitter cap (18I). (Fig. 1; para. 2-4).

Since Feng et al. ('530) and *Applicant's admitted prior art* are both from the same field of endeavor, a heterojunction bipolar transistor, the purpose disclosed by *Applicant's admitted prior art* would have been recognized in the pertinent art of Feng et al. ('530). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Feng et al. ('530) by the emitter comprising a first sidewall with a first reentry feature consisting entirely of a first undercut profile as taught by *Applicant's admitted prior art* to minimize base resistance (para 3 & 4).

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Feng et al. ('530) in view of *Applicant's admitted prior art* as applied to claim 14 above, and further in view of Feng et al. (6,770,919).

Feng et al. ('530) in view of *Applicant's admitted prior art* disclose the subject matter claimed above except the base comprising a fourth sidewall with a fourth reentry feature consisting entirely of a fourth undercut profile.

Feng et al. ('919) disclose a heterojunction bipolar transistor where a collector (6) is atop a sub-collector (2), a base (8) atop the collector (6); a base contact (20) atop the base (8); an emitter (14) atop the base (8); an emitter cap (16) atop the emitter (14), the

emitter cap (16) comprising a first sidewall with a first reentry feature consisting entirely of a first undercut profile, and an emitter metal (18) atop the emitter cap (16). Feng et al. ('919) further disclose the collector (6) comprising a second sidewall reentry feature consisting entirely of a second undercut profile. Feng et al. ('919) also disclose the base comprising a third sidewall with a third reentry feature consisting entirely of a third undercut profile (Fig. 2F; col. 4, line 32 thru col. 5, line 13).

Since Feng et al. ('530) and Feng et al. ('919) are both from the same field of endeavor, a heterojunction bipolar transistor, the purpose disclosed by Feng et al. ('919) would have been recognized in the pertinent art of Feng et al. ('530). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Feng et al. ('530) by the base comprising a sidewall with a reentry feature consisting entirely of an undercut profile as taught by Feng et al. ('919) to achieve high speed, low noise performance in heterojunction bipolar transistors (col. 2, lines 23-44).

Response to Arguments

Applicant's arguments filed 21 June 2007 have been fully considered but they are not persuasive. As stated above, Feng et al. in view of *Applicants' prior art* disclose the heterojunction bipolar transistor as described in independent claim 1.

In response to the applicant's arguments, the applicant argues examiner has failed to establish a *prima facie* case of obviousness because there is no suggestion or motivation to combine. However, Feng et al. ('530) teaches the emitter having a reentry

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feature, applicant prior art is used as evidence to show that an reentry feature may consist to an entire undercut profile. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Feng et al. ('530) by the emitter comprising a first sidewall with a first reentry feature consisting entirely of a first undercut profile as taught by *Applicant's admitted prior art* to minimize base resistance (para 3 & 4).

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

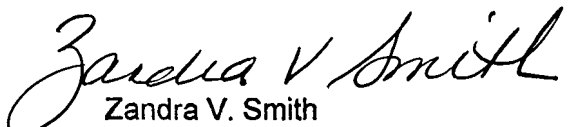
shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pamela E. Perkins whose telephone number is (571) 272-1840. The examiner can normally be reached on Monday thru Friday, 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith can be reached on (571) 272-2429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

PEP
3 September 2007


Zandra V. Smith
Supervisory Patent Examiner
4 Sept. 2007